UNTIL the beginning of this century, paper was almost entirely made by hand in separate sheets, the manufacture of continuous paper being almost unknown. Gradually, however, the paper-machine was introduced and developed, until now machines producing seven tons or more of paper a day are not uncommon.

We found the machine-room to be a long, low apartment, in which we could hardly hear ourselves speak. The machine itself extended nearly the whole length of the room, and for the first part consisted in its essential element of a broad, endless belt of wire gauze, upon which the pulp, previously thinned by the admixture of water, flows after passing through various screens and reservoirs. In order that the pulp may be deposited evenly, a constant shaking motion is imparted to the wire gauze as it moves along, and as the water drains from the pulp the fibres become locked together until finally the sheet obtains a considerable degree of consistency. It then passes over the perforated covers of two suction-boxes, in which a partial vacuum is maintained. Here the greater part of the water in the sheet is forced into the boxes by the atmospheric pressure, and the sheet has now sufficient strength to leave the gauze, and pass over the short space intervening before the press-rolls are reached. Laid papers, however, and those bearing a water-mark, receive a further treatment at the time of their passage over the suction-boxes. In such cases a small skeleton roller, made, for laid paper, of stout brass wires, having a short distance between them and connected by other wires, which encircle the roller, is placed between the suction-boxes, where the wires by pressing into the moist pulp cause variations in thickness, which produce the effect of lines upon the finished paper. The water-mark is produced in the same way, by arranging the wires upon the roller so that they form the proper design.

The press-rolls, to which the sheet next passes after leaving the wire gauze, are a system of metal rollers, between which the paper is carried by an endless belt of felt or blanket-cloth. The pressure of the rolls serves to lock the fibres more closely together, thereby strengthening the paper which next meets the dryers as it still moves forward.

These are a number of large, hollow cylinders of iron, which are heated by steam admitted to the interior. The number of these dryers varies in different machines, there being sometimes on machines for making paper-board as many as twenty-one. By the time the paper reaches the last dryer, it is generally almost entirely free from moisture, and the broad sheet as it leaves the dryers is cut into two or three narrow ones by circular knives. In case it is merely a printing paper or a paper which has not been "animal sized," these narrow strips are wound upon reels, which are removed as soon as the proper quantity is upon them. In case it is to be writing paper, however, the band of paper after leaving the belt of blanket-cloth, and having been cut into narrower bands, is led through a bath of liquid glue prepared from scraps of hoofs and hides, which permeates the fibres, and renders the paper impervious to ink. After leaving the bath the superfluous glue is brushed off the paper, which is then cut into sheets by a series of revolving knives, and deposited in piles.

The sheets are then taken to the drying loft, and laid, two or three at a time, across long poles, in much the same way that clothes would be hung out to dry. An immense amount of time and money has been spent in endeavors to dry animal-sized papers directly and continuously upon the machine, in some such way as the engine-sized papers are dried, but so far all attempts have been in vain; the glue cracks badly if rapidly dried, and the paper is on other accounts found to be imperfectly sized. By the slow process of drying employed, in spite of its many disadvantages and the large amount of room it requires, the glue is mostly left near the surface of the paper, where it is most needed. If the paper is rapidly dried, the glue has a tendency to strike in toward the centre. After remaining for about three days in the drying-loft, at the end of which time the glue has become well dried throughout the sheet, the paper is removed to